AMENDMENTS TO THE CLAIMS

Please cancel claims 66 and 69, amend claims 67, 68 and 70, and add new claims 72-80. No new matter is believed to be introduced by the aforementioned amendments and new claims. The following listing of claims will replace all prior versions and listings of claims in the application.

1-31. **(Canceled)**

32. **(Withdrawn)** An optoelectronic device comprising:

a first mirror;

a second mirror;

an active region situated between the first mirror and the second mirror; and

at least one heat conducting layer in contact with the active region for carrying heat that is generated in the active region away from the active region.

33. **(Withdrawn)** An optoelectronic device according to claim 32 wherein the at least one heat conducting layer includes a lower heat conducting layer disposed below the active region and an upper heat conducting layer disposed above the active region.

34. **(Withdrawn)** An optoelectronic device comprising:

a first mirror;

a second mirror;

an active region situated between the first mirror and the second mirror; and

at least one heat conducting layer in thermal communication with the active region, at least one of the heat conducting layers including a doping profile across its thickness that has a higher doping level at or near an electric field trough and a lower doping level at or near an electric field peak.

35. **(Withdrawn)** An optoelectronic device according to claim 34 wherein the active region comprises:

a lower p-n junction;

a first tunnel junction above the lower p-n junction;

an upper p-n junction; and

a second tunnel junction above the upper p-n junction.

36. **(Withdrawn)** An optoelectronic device according to claim 35 wherein at least one of the heat conducting layers is n-type.

37. **(Withdrawn)** An optoelectronic device according to claim 36 wherein the first and second mirrors are n-type.

38. **(Withdrawn)** An optoelectronic device according to claim 34 wherein the one or more heat conducting layers include a lower heat conducting layer disposed below the active region and an upper heat conducting layer disposed above the active region.

39. **(Withdrawn)** An optoelectronic device according to claim 38 wherein the upper heat conducting layer is isotropically formed as a current spreader.

40. **(Withdrawn)** An optoelectronic device according to claim 39 wherein the upper heat conducting layer is lightly doped.

41. **(Withdrawn)** An optoelectronic device, comprising:

a first mirror;

a second mirror;

an isolation region defining an aperture wherein the aperture encircles an optical cavity of the optoelectronic device;

an active region situated between the first mirror and the second mirror; and

at least one heat conducting layer in thermal communication with the active region and extending across at least part of the optical cavity.

42. **(Withdrawn)** An optoelectronic device according to claim 41 wherein the at least one heat conducting layer extends across the optical cavity defined by aperture of the isolation region.

43. **(Withdrawn)** An optoelectronic device according to claim 41 wherein the isolation region includes an isolation layer that defines the aperture.

44. **(Withdrawn)** An optoelectronic device according to claim 41 wherein at least part of the optical cavity is doped to have a low resistance.

45. **(Withdrawn)** An optoelectronic device according to claim 41 wherein the first mirror includes a number of DBR mirror layers, and the isolation region includes an isolation layer that is interposed between selected DBR mirror layers and defines the aperture.

46. **(Withdrawn)** An optoelectronic device according to claim 45 wherein the isolation region further includes an isolation implant extending around, and spaced outwardly from, at least part of the aperture of the insulating layer and traverses through the insulating layer and at least part of the first mirror.

47. **(Withdrawn)** An optoelectronic device according to claim 46 wherein the isolation implant defines an aperture that is larger than the aperture of the insulating layer.

48. **(Withdrawn)** An optoelectronic device according to claim 47 wherein the aperture of the isolation implant is substantially coaxial with the aperture of the insulating layer.

49. **(Withdrawn)** An optoelectronic device according to claim 41 where the isolation region corresponds to an etched region.

50. **(Withdrawn)** An optoelectronic device according to claim 41 wherein the isolation region includes an isolation implant.

51. **(Withdrawn)** An optoelectronic device according to claim 50 wherein the isolation implant includes a proton implant.

52. **(Withdrawn)** An optoelectronic device according to claim 41 wherein the at least one heat conducting layers includes a first heat conducting layer on one side of the active region and a second heat conducting layer on the opposite side of the active region.

53. **(Withdrawn)** An optoelectronic device according to claim 41 wherein at least one heat conducting layer includes a doping profile across its thickness that has a higher doping level at or near an electric field trough and a lower doping level at or near an electric field peak.

54. **(Withdrawn)** An optoelectronic device according to claim 41 wherein the at least one heat conducting layer includes a uniform doping profile across its thickness.

55. **(Withdrawn)** An optoelectronic device according to claim 41 further including at least one tunnel junction at or near the active region.

56. **(Withdrawn)** An optoelectronic device according to claim 55 wherein the first mirror, the second mirrors and the at least one heat conducting layer are n-type.

57. **(Withdrawn)** An optoelectronic device according to claim 41 wherein the active region includes:

a first p-n junction;

a first tunnel junction disposed adjacent the first p-n junction;

a second p-n junction disposed adjacent to the first tunnel junction; and

a second tunnel junction disposed adjacent the second p-n junction.

58. **(Withdrawn)** An optoelectronic device according to claim 57 wherein the first p-n junction includes one or more quantum wells, and the second p-n junction includes one or more quantum wells.

59. **(Withdrawn)** An optoelectronic device, comprising:

a lower DBR mirror;

an upper DBR mirror;

an isolation layer situated in or adjacent to the upper DBR mirror, the isolation layer defining an aperture wherein the aperture encircles an optical cavity of the optoelectronic device;

an active region situated between the lower DBR mirror and the upper DBR mirror, the active region extending laterally beyond the aperture defined by the isolation layer; and

a first heat conducting layer situated between the active region and the upper DBR mirror and extending across the optical cavity.

60. **(Withdrawn)** An optoelectronic device according to claim 59 further comprising a second heat conducting layer situated between the active region and the lower DBR mirror and extending across the optical cavity.

61. **(Withdrawn)** An optoelectronic device that is energized by an energizing current, comprising:

a top mirror;

a bottom mirror;

an active region situated between the top mirror and the bottom mirror; and

at least one heat conducting layer in thermal communication with the active region for removing heat from the active region, wherein the energizing current passes through at least part of each of the top mirror and the active region.

62. **(Withdrawn)** An optoelectronic device according to claim 61 wherein the energizing current also passes through at least part of the bottom mirror.

63. **(Withdrawn)** An optoelectronic device according to claim 62 wherein the top mirror, the bottom mirror and the active region are conductive.

64. **(Withdrawn)** An optoelectronic device according to claim 61 further comprising an isolation region situated in or adjacent to the top mirror, the isolation region defining a current confining aperture wherein the aperture encircles an optical cavity of the optoelectronic device.

65. **(Withdrawn)** An optoelectronic device according to claim 61 further comprising an isolation region situated in or adjacent to the bottom mirror, the isolation region defining a current confining aperture wherein the aperture encircles an optical cavity of the optoelectronic device.

66. **(Canceled)**

67. **(Currently Amended)** An optoelectronic device, comprising:

a first mirror;

a second mirror;

an active region situated between the first mirror and the second mirror;

a substantially equipotential layer; and

an ~~isolation~~ insulation layer defining an aperture that encircles an optical cavity of the optoelectronic device, the insulation layer situated between the second mirror and the substantially equipotential layer~~; and~~

~~within the aperture of the isolation layer, the optical cavity having one or more highly conductive layers~~.

68. **(Currently Amended)** An optoelectronic device according to claim 67 wherein the ~~one or more highly conductive layers are doped to be highly conductivity~~ substantially equipotential layer has a conductance in a range of about four (4) to about ten (10) times a conductance of the second mirror.

69. **(Canceled)**

70. **(Currently Amended)** An optoelectronic device according to claim 67 wherein the aperture of the ~~isolation~~ insulation layer includes a tapered tip.

71. **(Previously Presented)** An optoelectronic device according to claim 70 wherein the tapered tip is positioned at or near an electric field null.

72. **(New)** An optoelectronic device according to claim 67 wherein the substantially equipotential layer comprises a DBR mirror structure.

73. **(New)** An optoelectronic device according to claim 67 wherein an output of the optical cavity comprises a substantially single mode output.

74. **(New)** A single mode vertical cavity surface emitting laser (VCSEL), comprising:

a substrate having a lower surface and an upper surface;

a bottom electrical contact disposed along the lower surface of the substrate;

a lower mirror portion disposed upon the upper surface of the substrate;

an active region disposed upon the lower mirror portion;

an upper mirror portion disposed upon the active region;

an equipotential layer disposed upon the upper mirror portion;

an insulating layer interposed between the upper mirror portion and the equipotential layer and adapted to form an aperture therebetween; and

an upper contact portion disposed upon the equipotential layer outside the perimeter of the aperture.

75. **(New)** A VCSEL according to claim 74, further comprising:

an isolation region disposed beneath the upper contact portion and traversing the equipotential layer, the upper mirror portion, the active region, and the lower mirror portion; and

a second isolation region disposed beneath the second upper contact and traversing the equipotential layer, the upper mirror, the active region, and the lower mirror.

76. **(New)** A VCSEL according to claim 74, wherein the lower mirror portion is formed of n-type material.

77. **(New)** A VCSEL according to claim 74, wherein the active region has a plurality of quantum wells.

78. **(New)** A VCSEL according to claim 74, wherein the upper mirror portion is formed from an electrically isotropic material.

79. **(New)** A VCSEL according to claim 74, wherein the upper contact portion covers less than the entire equipotential layer, the VCSEL further comprising:

a first dielectric layer disposed upon the portion of the equipotential layer that is not covered by the upper contact portion; and

a second dielectric layer disposed upon the first dielectric layer.

80. **(New)** A VCSEL according to claim 79, wherein the second dielectric layer is substantially aligned with the aperture.